

REMARKS

Claims 1, 12, and 13 have been amended. Claims 1-22 are pending in the case. Further examination and reconsideration of pending claims 1-22 are hereby respectfully requested.

Section 102(e) Rejections

Claims 1-5, 9-17, 21, and 22 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,466,314 to Lehman (hereinafter "Lehman"). As will be set forth in more detail below, the § 102 rejections of claims 1-5, 9-17, 21, and 22 are respectfully traversed.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP § 2131. The cited art does not disclose all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

The cited art does not teach forming an aerial image of a reticle, which includes an image of light transmitted by an illuminated portion of the reticle, using a set of exposure conditions that is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen and detecting defects on the reticle using the aerial image. Amended independent claim 1 recites in part: "forming an aerial image of the reticle using a set of exposure conditions, wherein the aerial image comprises an image of light transmitted by an illuminated portion of the reticle, wherein the set of exposure conditions is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen...detecting defects on the reticle by comparing the aerial image to a reference image." Independent claims 12 and 13 have been amended to recite similar limitations. Support for the amendments to these claims can be found in the Specification, for example, on page 18, lines 7-9 and page 19, lines 6-14.

Lehman discloses a reticle design inspection system. Lehman, however, does not disclose forming an aerial image of a reticle, which includes an image of light transmitted by an illuminated portion of the reticle, using a set of exposure conditions that is substantially

equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen and detecting defects on the reticle using the aerial image. For example, Lehman states that "a manufacturing reticle is inspected by reticle inspector (22) to detect possible defects. This inspection can be performed using Orbot RT 8xxx series reticle inspection tool." (Lehman -- col. 9, lines 58-61). Lehman also states that a preferred embodiment of the invention relates to "a reticle inspection system, comprising: a database associating a plurality of feature patterns with a consequence of said feature patterns; an image input; and a matcher which matches said input image with said database." (Lehman -- col. 5, line 66 to col. 6, line 5). Therefore, Lehman teaches that a reticle inspection system includes an image input, which presumably includes an image of the reticle being inspected (e.g., an image generated by the Orbot tool).

However, Lehman does not teach that the image of the reticle is an image of light transmitted by an illuminated portion of the reticle, which is formed using a set of exposure conditions that is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen. Therefore, Lehman cannot teach detecting defects on a reticle using such an image. As such, Lehman does not teach forming an aerial image of a reticle, which includes an image of light transmitted by an illuminated portion of the reticle, using a set of exposure conditions that is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen and detecting defects on the reticle using the aerial image, as recited in claims 1, 12, and 13. Therefore, Lehman does not teach all limitations of claims 1, 12, and 13.

For at least the aforementioned reasons, claims 1, 12, and 13 are not anticipated by the cited art. In addition, claims dependent therefrom are also not anticipated by the cited art for at least the same reasons. Accordingly, removal of the § 102 rejections of claims 1-5, 9-17, 21, and 22 is respectfully requested.

Section 103(a) Rejections

Claims 6 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lehman. As will be set forth in more detail below, the § 103 rejections of claims 6 and 18 are respectfully traversed.

To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F.2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). The cited art does not teach or suggest all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

The cited art does not teach or suggest forming an aerial image of a reticle, which includes an image of light transmitted by an illuminated portion of the reticle, using a set of exposure conditions that is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen and detecting defects on the reticle using the aerial image, as recited in claims 1 and 13. For at least the reasons set forth above, Lehman does not teach all limitations of claims 1 and 13. Lehman also does not suggest all limitations of claims 1 and 13.

In particular, Lehman contains no suggestion for forming an image of light transmitted by an illuminated portion of a reticle using a set of exposure conditions that is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen and detecting defects on the reticle using the image. For example, as set forth in detail above, Lehman teaches that a reticle inspection system includes an image input, which presumably includes an image of the reticle being inspected. However, Lehman does not suggest that the image is an aerial image of a reticle, which includes an image of light transmitted by an illuminated portion of the reticle, formed using a set of exposure conditions that is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen.

Lehman also states that "a test reticle is generated (10)...The reticle is then preferably used in a stepper to print the circuit on a wafer, and the wafer is developed (20). The wafer (25) is then inspected for defects (30)." (Lehman -- col. 7, lines 13-26). Lehman also states that "a statistical evaluation of the defect transfer probability can be obtained. Alternatively or additionally, one or more wafers are generated using a plurality of different reticles and/or a plurality of different focus-exposure settings and/or a plurality of different process parameters, so that such statistics may be determined." (Lehman -- col. 2, lines 61-67). Therefore, Lehman

teaches imaging light transmitted by a reticle onto a wafer at process parameters used by a stepper to print an image of the reticle onto the wafer. In addition, Lehman teaches inspecting the wafer on which the reticle is printed to evaluate the transfer of defects from the reticle to the wafer. In other words, the wafer printed at the process parameters used by the stepper is inspected for defects.

However, the printed wafer is not an aerial image of the reticle. In particular, an aerial image of the reticle is formed by the stepper at the focal plane of the stepper. The printed wafer, however, differs from the aerial image due to the characteristics of the wafer and the process steps performed subsequent to exposure of the wafer. In particular, an aerial image of the reticle is projected onto a wafer by the stepper, but the printed wafer is different than the aerial image due to transfer of the aerial image to the wafer and development of the transferred aerial image. In addition, although Lehman discloses inspecting the printed wafer, Lehman does not teach or suggest detecting the aerial image projected onto the wafer by the stepper. Therefore, Lehman cannot teach or suggest detecting defects on a reticle using an aerial image of the reticle as presently claimed. For at least the reasons set forth above, therefore, Lehman does not teach or suggest forming an aerial image of a reticle, which includes an image of light transmitted by an illuminated portion of the reticle, using a set of exposure conditions that is substantially equivalent to exposure conditions used by an exposure system to print an image of the reticle onto a specimen and detecting defects on the reticle using the aerial image, as recited in claims 1 and 13. As a result, Lehman does not teach or suggest all limitations of claims 1 and 13.

For at least the reasons stated above, independent claims 1 and 13, as well as claims dependent therefrom, are patentably distinct over the cited art. Accordingly, removal of the § 103 rejections of claims 6 and 18 is respectfully requested.

Allowable Subject Matter

Claims 7, 8, 19, and 20 were objected to as being dependent upon a rejected base claim, but were deemed allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant appreciates the Examiner's indication of allowable subject matter and awaits allowance of the remaining claims in the case.

CONCLUSION

This response constitutes a complete response to all issues raised in the Office Action mailed December 14, 2005. In view of the remarks presented herein, Applicants assert that pending claims 1-22 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned earnestly requests a telephone conference.

The Commissioner is authorized to charge any fees which may be required, or credit any overpayment, to deposit account number 50-3268/5589-04001.

Respectfully submitted,



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